THREE NEW SPECIES OF *FLOURENSIA* (ASTERACEAE-HELIANTHEAE) FROM SOUTH AMERICA[1]

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ABSTRACT

Three new species of *Flourensia* (Asteraceae-Heliantheae) from South America are described: *F. peruviana* Dillon and *F. polycephala* Dillon from central and southern Peru respectively; and *F. blakeana* Dillon from northcentral Argentina.

The genus *Flourensia* is represented by at least four species in Peru, two of these described for the first time within this paper. *Flourensia macrophylla* Blake is represented by scattered populations in valleys of various rivers draining into the Pacific along the western slope or Cordillera Occidental from northern to central Peru (2,500–3,500 m). *Flourensia angustifolia* (DC.) Blake is found in intermontane valleys associated with the tributaries of the Río Perené and Río Huallaga in the Cordillera Central (1,700–3,300 m). *Flourensia peruviana* Dillon and *F. polycephala* Dillon are distributed in dry sites in valleys with eastern drainage from southcentral and southern Peru. *Flourensia heterolepis* Blake is represented by scattered populations in the Cordillera Real of southeastern Bolivia (ca. 2,700 m), a distance of ca. 725 km from the southeastern Peruvian taxa. Each species is readily distinguished by a complement of morphological characters and a distinct geographical distribution. The distributional pattern of these taxa corresponds with regions postulated to have undergone a series of humid-arid cycles during the Quaternary, which drastically and repeatedly altered vegetation patterns (Vuilleumier, 1971; Simpson, 1975). While it is difficult to accurately determine when and how these taxa attained their present distributions, a rather recent radiation is suggested. A similar pattern of species distribution is exhibited in other taxa occupying various habitats in the Peruvian Andes (Simpson, 1975). An additional example is found in *Tecoma* (Bignoniaceae) (Gentry, 1979) which has unique taxa in each of the major valleys similarly occupied by different *Flourensia* species.

The following key compares the salient differences between all the *Flourensia* species of Peru and adjacent Bolivia. Figure 1 illustrates the distribution of these species.

1a. Leaves shallowly denticulate.
  2a. Leaves oval to oblong-oval, the apex obtuse to subobtuse ..... *F. macrophylla*
  2b. Leaves lanceolate to narrowly-elliptic, the apex acute ..... *F. angustifolia*
1b. Leaves strictly entire.
  3a. Outer phyllaries 2–3 mm long, the inner 3–5 mm long, all ca. 1.5 mm wide .... *F. peruviana*

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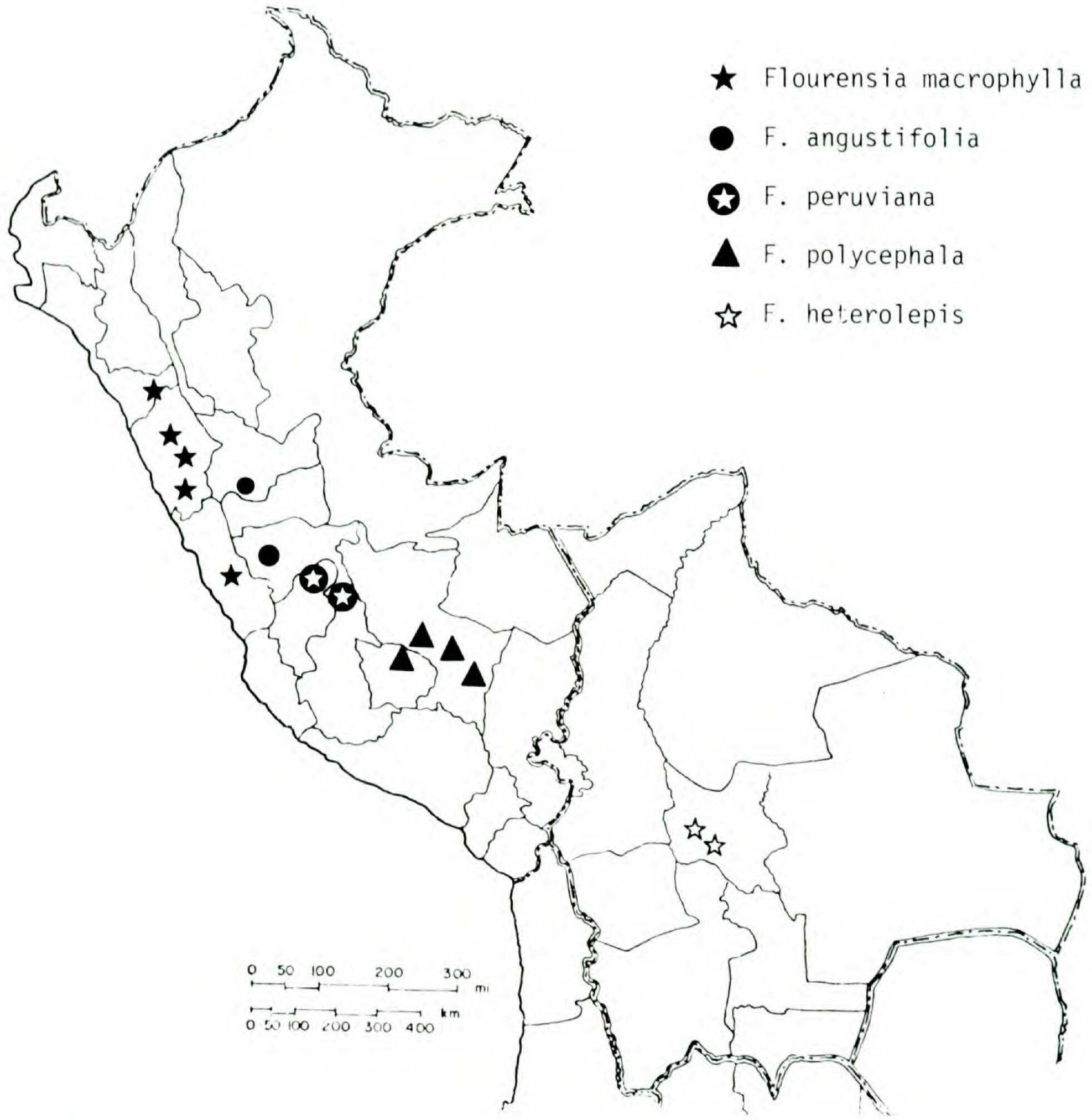

FIGURE 1. Distribution map of *Flourensia* species in Peru and adjacent Bolivia.

3b. Outer phyllaries 5–9 mm long, the inner 8–10 mm long, all (1–)2–3(–3.5) mm wide.
4a. Inflorescences 2–5-flowered, terminal and axillary (central Bolivia) ..... *F. heterolepis*
4b. Inflorescences 4–8-flowered, cymose ..... *F. polycephala*

Flourensia polycephala Dillon, sp. nov.—Fig. 2.

Species haec ab *F. heterolepis* Blake differt capitulis numerosis, inflorescentia cymosa, phyllariis extimis (5–)7–8 mm longis, ca. 1 mm latis, intimis rhombeo-ovatis, 8–9 mm longis, 3.0–3.5 mm latis, floribus radii 10–13, pappo saepe articulato.

Shrub to 4 m; branchlets striate, resinous. *Leaves* lanceolate, to lance-elliptic, (8–)10–12(–14) cm long, 1.5–2.5(–3.0) cm wide, entire, acute or rarely obtuse, broadly acuminate, the margins strigillose; petioles 2–5 mm long. *Inflorescence* 4–8-flowered, cymose-paniculate; peduncles (1–)3–5(–7) cm long. *Capitula* 1.0–1.5 cm wide (excluding the ray florets), 1.5–2.0 cm high; involucre graduated, 3-seriate; outer phyllaries linear-lanceolate, (5–)7–9 mm long, ca. 1 mm wide,

FIGURE 2. *Flourensia polycephala* Dillon, ×¾. [After *Marin 231* (F).]

acute, glandular, keeled, the inner phyllaries rhombic, 8–9 mm long, 3.0–3.5 mm wide, attenuate, laterally chartaceous, glandular, keeled; paleas ca. 9 mm long, ca. 3 mm wide, acute to obtuse, erose, glandular; ray florets 10–13, the ligules oblong, ca. 3 cm long, 5–6 mm wide, the tube ca. 5 mm long; disc florets 20–30, ca. 7 mm long, cylindric-campanulate. *Achenes* obconical, 8–9 mm long, ca. 3 mm wide, depressed ovate in cross-section, villous; pappus of 2 awns, ca. 3 mm long, readily disarticulating, squamellae absent.

TYPE: PERU. CUZCO. Pisac, Apr. 1943, 3000 m, *Marin 231* (LIL, holotype; F, isotype).

Flourensia polycephala differs from *F. heterolepis* Blake in having more nu-

merous capitula and cymose inflorescences. It differs from its nearest geographic neighbor, *F. peruviana*, in having longer phyllaries and more ray florets.

This species is known from dry, rocky slopes in the quebradas associated with the Río Apurimac and Río Urubamba in southeastern Peru (2,700– 3,200 m) (Fig. 1). Flowering Jan.–Apr.

Additional Specimens Examined: PERU. APURIMAC: Grau, Orepeza Valley, *Vargas 9784* (F, UC). CUZCO: *Ellenberg 1000* (US). Huasao, *Herrera 3098* (US). Urubamba, lower end of Quebrada Pumahuanco, ca. 2–4 km NW of Urubamba, *Iltis et al. 854* (US). Urubamba, *Lamallva 53* (LPS); Hda. Urco, Vilconota Valley, *Vargas 638* (MO). Rumichaca, *Vargas 9597* (LIL). Chicón Canyon, *Vargas 11053* (UC).

Flourensia peruviana Dillon, sp. nov.—Fig. 3.

Species haec ab *F. polycephala* Dillon differt involucro minore, phyllariis reductis aliter isdem, foliis magnitudine formaque similiter *F. angustifolia* (DC.) Blake, cognata approximatissiam, sed differt folia integra. Pappus acheniorum interdum artisis disarticulatis duo 3 mm longis confectus.

Shrub to 2 m; branchlets striate, resinous. *Leaves* lanceolate to oblong-lanceolate, (5–)7–10(–12) cm long, (1.0–)1.5–2.0 (–3.0) cm wide, entire, acute to obtuse, broadly acuminate, the margins strigillose; petioles (2–)4–8(–10) mm long. *Inflorescence* 4–8-flowered, cymose-paniculate; peduncles 0.5–5.0 cm long. *Capitula* 7–10 mm wide (excluding ray florets), ca. 10 mm high; involucre graduated, 2–3-seriate; outer phyllaries lanceolate, ca. 2 mm long, ca. 1 mm wide, acute, glandular, keeled, the inner phyllaries elliptic-obovate, ca. 5 mm long, ca. 1.5 mm wide, laterally chartaceous, glandular, keeled, acute; paleas ca. 9 mm long, rounded apically, erose, glandular; ray florets 8–10, the ligules oblong to oval, 10–18 mm long, ca. 5 mm wide, the tube ca. 5 mm long; disc florets 20–40, ca. 7 mm long, cylindric-campanulate. *Achenes* obconical, ca. 10 mm long, 2–3 mm wide, depressed ovate in cross-section, villous; pappus of 2 slender awns, ca. 3 mm long, readily disarticulating, squamellae absent.

TYPE: PERU. HUANCAVELICA: Checcyancu a 4 km E of Conaica, 3000–3500 m, 14 Mar. 1971, *Tovar 193* (US, holotype; LPS, USM, F, isotypes).

Flourensia peruviana differs from *F. polycephala* in possessing a much smaller involucre with the phyllaries reduced in size, but essentially the same shape. Its leaves are comparable in size and shape to *F. angustifolia* (DC.) Blake, its nearest geographic neighbor, but differ in having strictly entire margins. This species is known from southcentral Peru on dry, rocky slopes in the quebradas associated with the Río Mantaro (1,700–3,500 m) (Fig. 1). Flowering Mar.–Apr.

Additional specimens examined: PERU. AYACUCHO: La Mejorada to Ayacucho, KM 15, *Ochoa 574* (GH). Huamanga, Chaquihuaycco, arriba de Ayacucho, *Tovar 5491* (USM). Chanchara, Río Cachi, *Tovar 5589* (USM). Alrededores de Ayacucho, *Tovar 5709* (USM). HUANCAVELICA: Tayachaja, between Izuchaca and Mariscal, *Tovar 1378* (LPS).

Another new species of *Flourensia* from Argentina may also conveniently be described here.

Flourensia blakeana Dillon, sp. nov.—FIG. 4.

Frutex 0.4–1.0 m alto, ramoso, cortice cana ad nigra, ramulis nigris. Folia (1.5–)2.0–3.5(–4.7) cm longa, (0.3–)0.4–0.8(–1.1) cm lata, anguste oblongo-elliptica, acuta, acuminata, integra, marginibus strigillosis; petiolis 1–3 mm longis. Capitula 1–4, terminales axillaresque, cymosa (5–)7–10(–14) mm

FIGURE 3. *Flourensia peruviana* Dillon, ×¾. [After *Tovar 193* (F).]

FIGURE 4. *Flourensia blakeana* Dillon, ×⅔. [After *Dillon & Rodríguez 560* (F).]

lata, 6–11 mm alta, pedunculis 1–4 cm longis, involucro 2-seriato, phyllariis aequalibus (3–)4–6(–7) mm longis, ca. 1 mm latis, extimis linearo-lanceolatis, intimis anguste rhombeis, attenuatis, herbaceis, nigris, basim strigillosis, paleis 5–6 mm longis, obtusis, nigellis. Flores radii ca. 8, disci ca. 25, corollis ca. 4.5 mm longis, cylindricis-campanulatis. Achenia obconica, ca. 6 mm longa, ca. 2 mm lata, villosa, pappi aristis duo ca. 3.5 mm longis persistentibus confecti, squamellis carentes. Chromosomatum numerus $n = 18$.

Much-branched *shrub*, 0.4–1.0 m tall, the bark gray to black; branchlets black. *Leaves* narrowly oblong-elliptic, (1.5–)2.0–3.5(–4.7) cm long, (0.3–)0.4–0.8(–1.1) cm wide, acute to acuminate, entire, the margins strigillose; petioles 1–3 mm long. *Inflorescence* cymose, 1–4-flowered; peduncles 1–4 cm long. *Capitula* (5–)7–

10(–14) mm wide (excluding the ray florets), 6–11 mm high; involucre 2-seriate; phyllaries (3–)4–6(–7) mm long, ca. 1 mm wide, black, the outer linear-lanceolate, the inner narrowly rhombic, attenuate, herbaceous, the bases strigillose; paleas 5–6 mm long, obtuse, blackish; ray florets ca. 8, the ligules oblong-oval, 1.0–2.4 cm long, 5–8 mm wide, the tube 3–4 mm long; disc florets ca. 25, the corollas ca. 4.5 mm long, cylindrical-campanulate. *Achenes* obconical, ca. 6 mm long, ca. 2 mm wide, villous; pappus of 2 awns, ca. 3.5 mm long, persistent, squamellae absent. Chromosome number: $n = 18$.

TYPE: ARGENTINA. TUCUMÁN: Km 95–105 on Rt. 307, between Amaichá del Valle and Tafí del Valle, 2900–3000 m, 22 Feb. 1973, *Dillon & Rodríguez 560* (TEX-LL, holotype; F, MO, isotypes).

Flourensia blakeana is a frequent element of the xeric shrub formation in the Cuesta del Infiernillo, usually associated with *Psila boliviensis* and various *Senecio* species. It most closely resembles *F. fiebrigii* Blake, from the mountain valleys of southwestern Bolivia and adjacent Argentina, but the latter is distinguished by its larger leaves and more robust habit, and by a generally more pubescent involucre. The specific epithet commemorates Sidney F. Blake (1892–1959), noted American synantherologist.

Additional specimens examined: ARGENTINA. CATAMARCA: Santa María, Torollaco, *Reales 1056* (LIL). Pafanquillo, *Reales 1702* (LIL). TUCUMÁN: Ca. 25 km NW of Tafí del Valle, *Bacon & Bohnstedt 77* (TEX-LL). Cuesta del Infiernillo, *Cabrera & Frangi 20763* (LPS). Devisadero, Cafayate–Tafí del Valle, *Carenzo 1358* (LIL). Cardones, *Castillon 3274* (A). Alto del Fio, *Castillon 3115* (LIL). Tafí, KM 95, Los Cardones, camino del Infiernillo a Amaichá, *Legname & Vervoorst 34* (NY). Machorastroja, *Schreiter 1311* (LIL). Amaichá to Santa María, *Schreiter 5636* (A, LIL). Las Arcas, *Schreiter 5637* (A, LIL). Quebrada del Chorro, *Venturi 4110* (LIL, US).

LITERATURE CITED

GENTRY, A. H. 1979. Distribution patterns of neotropical Bignoniaceae: some phytogeographic implications. Pp. 339–354, *in* K. Larsen & L. B. Holm-Nielsen, Tropical Botany, Academic Press, New York.

SIMPSON, B. B. 1975. Pleistocene changes in the flora of the high tropical Andes. Paleobiology 1: 273–294.

VUILLEUMIER, B. S. 1971. Pleistocene changes in the fauna and flora of South America. Science 173: 771–780.